



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,859	03/31/2004	Raghunath Vitthal Chaudhari	U 015127-5	5592
<div>140 7590 06/01/2007</div> <div>LADAS & PARRY</div> <div>26 WEST 61ST STREET</div> <div>NEW YORK, NY 10023</div>				
			EXAMINER	
			PUTTLITZ, KARL J	
			ART UNIT	PAPER NUMBER
			1621	
			MAIL DATE	DELIVERY MODE
			06/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/814,859

Applicant(s)

CHAUDHARI ET AL.

Examiner

Karl J. Puttlitz

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-97 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration:
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-97 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

KARL PUTTLITZ
PATENT EXAMINER

5/24/2007

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Art Unit: 1621

DETAILED ACTION

The rejection under section 112, second paragraph is withdrawn in view of the amendments defining variable "R".

The rejections under section 103 are maintained and repeated below. Applicant remarks in connection with this ground of rejection are also addressed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al., **Bulletin of the Chemical Society of Japan, Vol.52 (1979) , No.9** pp.2735-2736 (Watanabe).

The rejected claims cover, inter alia, A process for preparing dioxy-functionalized propane compounds [see formula in claim 1]

which comprises:

(a) contacting a vinyl carboxylate with carbon monoxide and hydrogen in a solvent in the presence of transition metal catalyst, to obtain an intermediate product mixture comprising of 3-carboxypropanal and 2-carboxypropanal;

(b) adding water to the intermediate product mixture of 3-carboxypropanal and 2-carboxypropanal to extract the carboxypropanals into water to obtain an aqueous phase

Art Unit: 1621

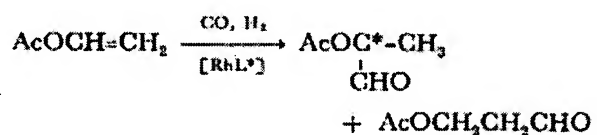
comprising of carboxypropanals and an organic phase comprising of transition metal catalyst and separating the aqueous phase from the organic phase;

(c) contacting the aqueous phase comprising of carboxypropanals with hydrogen in presence of a heterogeneous hydrogenation catalyst to obtain a hydrogenation product mixture comprising of 3-carboxypropanol and 2-carboxypropanol in aqueous phase and separating the hydrogenation catalyst from the aqueous phase;

(d) contacting the aqueous phase obtained in (c) comprising of carboxypropanols with a hydrolysis catalyst at a temperature within the range of 30 °C to 120°C. at least during a portion of a hydrolysis step to provide a product mixture comprising of 1,3- and 1,2-propanediol and a corresponding carboxylic acid;

(e) separating and recovering carboxylic acid, 1,3- and 1,2-propanediols from the aqueous mixture by distillative separation.

With regard to the above embodiments, Watanabe teaches the preparation of acetoxypromanal from vinyl acetate at page 2735:



Watanabe also teaches that tertiary phosphine–rhodium catalysts are useful for the above reaction. Watanabe also teaches that hydrogenation and hydrolysis of 2-acetoxypromanal with lithium aluminum hydride and 1 M HCl to produce optically active 1,2-propanediol. However, Watanabe could get only 2-acetoxypromanal with rhodium catalyst and the hydrogenation and hydrolysis is carried out with hazardous reagents. See page 2735.

Watanabe fails to explicitly teach the extracting and recycling requirements of the instant claims. However, these aspects of chemical synthesis are well within the motivation of those of ordinary skill for the purposes of optimizing the yield and efficiency of the process, and are thus, prima facie obvious.

Claims 23-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of U.S. patent No. 5,530,150 to Takaya et al (Takaya).

The rejected claims cover those embodiments wherein a cobalt carbonyl catalyst includes a lipophilic promoter in an amount effective to promote the hydroformylation reaction to acetoxyprominals. It is for this proposition that the examiner joins Takaya, which teaches a hydroformylation reaction of vinyl acetate in reference example 1, see column 26. Cobalt can be used as the transition metal, see column 8. Specifically, additives such as fatty amines and pyridine compounds can be added to the hydroformylation reaction mixture, see column 12, lines 40-53. Those of ordinary skill would have been motivated to modify the disclosure of Watanabe to include the required cobalt catalyst and lipophilic amines since Takaya teaches that this combination improves activity, positional and steric selectivity of the catalyst. Therefore the combination of Watanabe and Takaya renders the rejected claims prima facie obvious since these references teach or suggest the elements of the rejected claims with a reasonable expectation of success.

With regard to the required reaction parameters listed in the claims, these aspects of chemical synthesis are well within the motivation of those of ordinary skill for

Art Unit: 1621

the purposes of optimizing the yield and efficiency of the process, and are thus, prima facie obvious. Moreover, the rearrangement of steps (claim 87, for example) are prima facie obvious since the reverse reactions taught by the references are within the motivation of those of ordinary skill to provide the desired propanals.

Applicant argues that Watanabe teaches preparation of only 1,2-propanediol and not a mixture of 1,2-propanediol and 1,3 propanediol as claimed in claims 1-22. As discussed on page 3 of the specification art as noted by the examiner, Watanabe only obtained 2-acetoxypropanal with rhodium catalyst and the hydrogenation and hydrolysis is carried out with hazardous reagents.

However, Watanabe teaches preparation of the same dioxy-functionalized propane compounds of the formula in claim 1. Moreover, Watanabe teaches the same steps as required by the claims, and those of ordinary skill would expect the same products be formed. In this regard, there is no evidence on record that the process of Watanabe would not produce the claimed products.

Applicant also argues that there is no suggestion in the combination of Watanabe and Takaya that would lead to the claimed invention. In fact, there is no suggestion to combine the '150 patent with Watanabe. Watanabe teaches preparation of asymmetric 1,2- propanediol and therefore, one skilled in the art would not consider both of these references to obtain a process to produce 1,2- and 1,3- propanediols. Further Takaya teaches the use of benzene during hydroformylation and the phosphine catalyst precursor of Takaya is different from the instant invention. There is no suggestion nor

Art Unit: 1621

motivation to replace the catalyst of Watanabe with the catalyst of Takaya to obtain 1,2 and 1,3 propanediols in the yields and selectivities claimed in this application.

However, Takaya is teaches a hydroformylation reaction of vinyl acetate, wherein cobalt can be used as the transition metal, and specifically, additives such as fatty amines and pyridine compounds can be added to the hydroformylation reaction mixture, see column 12, lines 40-53. In this regard, Takaya is combined for the proposition that the required cobalt catalyst and lipophilic amines are obvious in the process since Takaya specifically teaches that this combination improves activity, positional and steric selectivity of the catalyst.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KARL PUTTLITZ
PATENT EXAMINER

5/24/2007